Alto
User manuals
Hardware installations

Software implementation manuals are available on our Web site:
www.leroy-automation.com

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Environment Tests

EMC

EMISSION : NF EN 50081-2 (Industrial Environnement)

Disruptions limits : radiation at a test distance of 3m access wrapping for the industrials appliances, scientific and medicals (ISM)

30 à 230 MHz	Emission < 50dBµV
230 à 1000 MHz	Emission < 57dBµV

IMMUNITY : NF EN 61 131-2 (94) and amendements A11 (96) and PrA12 (99)

The norm specify that the appliance working must be nominal except for the analog I/O and for the digital I/O with fast reply : with perturbations they can be wrong.

Electrostatic discharge : NF EN 61000-4-2

In air	> ±8KV
At contact	> ±4KV

Immunity to electromagnetic field at radio electric frequency with amplitude modulation (access wrapping) : NF EN 61000-4-3

26 à 1000 MHz , 10 V/m , 80% MA	OK

Fast transients / bursts : NF EN 61000-4-4

Direct application on all power supply	>±2kV/5kHz
Capacitive application on the I/O ≥24V	>±1kV/5kHz
Capacitive application on the analog I/O and communication signals	>±250V/5kHz

Damped oscillatories waves : NF EN 61000-4-12

Direct injection, differential mode on all power supply	>±1kV
Direct injection, differential mode on the I/O ≥24V Frequency 1MHz 400cp/s	>±1kV

Emission improved for an appliance of class A group 1 :NF EN 55011

150KHz à 500KHz	<79dBµV
500KHz à 30MHz	<73dBµV

Immunity to shock waves for industrials environments NF EN 61000-6-2 (criterion B)

differential mode on power supply	>±500V
common mode on power supply	>±500V
common mode on the I/O	>±1000V

Input and output immunity to shock waves for a class 3 installation NF EN 61000-4-5

differential mode	>±1kV
common mode	>±2kV

Continuité de masse mécanique : NF F 67-001-5

	R≤100mΩ

Isolation resistivity : EN 50155

500V dc	R>20MΩ

Voltage isolation during sinusoid wave 50Hz during 1mn
NF EN 61 131-2 (94) and amendements A11 (96) et PrA12 (99) :

Between AES and ground	U>1780V
Between communication ports and ground	U>1000V
Between communication ports and AES	U>1000V
Between communication ports	U>500V

Climatic tests
Climatic tests in working

Temperature use	–20°C to +70°C
Wet heat	+55°C 95% hygrometric

Mechanical tests
Mechanicals essays: EN 50155 **(Embedded Railway standardization)**

Vibrations 20m/s/s in 3 orthogonal plans	1st essay : 150 hz while 15 mn 2nd essay : 1h45 with sweep frequency from 5hz to 150Hz (1 octave / minute)

Shocks 20 m/s half sinus 3 shocks in 3 orthogonal plans along the 2 directions	2 g

Watertighty

NF EN 60529	IP30

Central units : B520,B530,B540,B521,B531,B541

Range

The range is composed of

1. 6 central processing units models P ALT UCR B xxx (see underneath) depending on communication ports and extension possibilities.
2. 1 central processing unit for extension P ALT UCR B510.

P ALT UCR B 5xx	Compact Units	Multi-block Systems with : - Management of Extension Blocks by Infrared Beam - Connector for additional compact flash memory
2 asynchronous ports	B 521	B 520
1 Ethernet port (10 base T)	B 541	B 540
1 Ethernet port and 2 asynchronous ports	B 531	B 530

Warning

- **Disconnect the AES power supply connector.**
- **Install the AES module on the UCR module before switching on the power.**
- **Do not touch an AES module that does not have the UCR module when the power is switched on.**

Failure to comply with these precautions may lead to personal injury or cause the device to be damaged.

Power supply

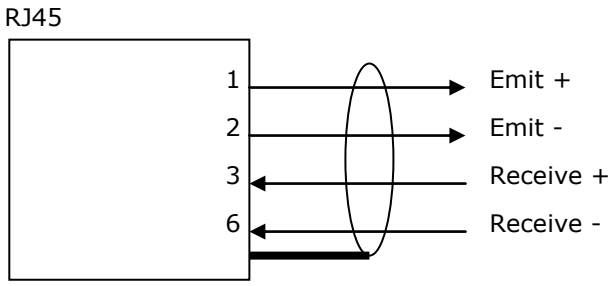
Power supply of the UCR module is provided by the AES module.

UCR module consumption	
- Compact Units	3.8 W
- Multi-block Systems	4.8 W

Processor

Supervisor	Microprocessor must activate this component every 500ms. otherwise reset of CPU
View of state	Bicolour led (green/red) : see the software manuals for meanings
Program memory	Flash 512 Ko
Data memory	Ram 512 Ko
Backup memory	Flash (1 Ko data saved during the 10ms power reserve after power cut)
Optional memory	Compact Flash type I from 8Mo to 196Mo
Clock/ Calendar	
resolution	10 ms
backup	By capacity 0.22F, minimum charge duration : 8mn 30s
autonomy	100 hours at 40°C
Ethernet communication	10 base T
Connector	Shielded RJ45
Medium	FTP twisted, shielded pair (100 Ω)
Length	100 m maximum between hub and Alto
Topology	Star network by point to point connection

Ethernet port



1 green led : Tx	lit while sending frames
1 green led : Lnk	lit if the port is correctly wired
1 red led : Col	lit on collision detection by Alto

Serial link (UCR B 521, 531, 520, 530)

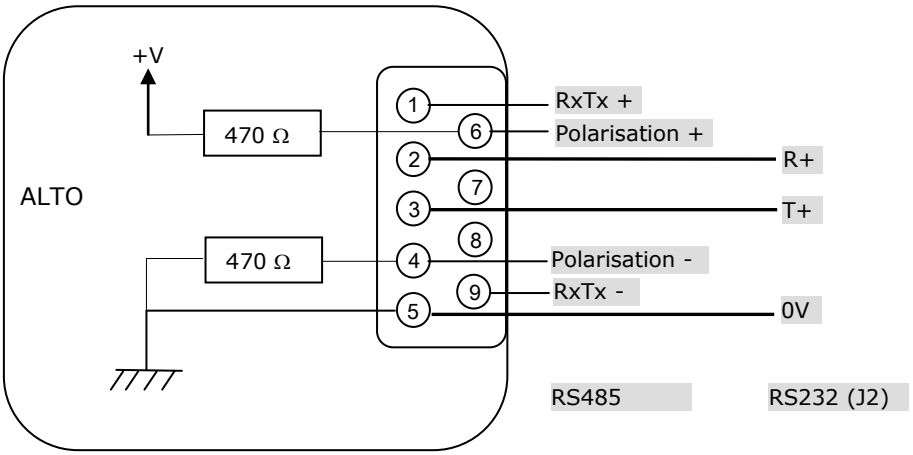
Connector label	J2	J3
Channel	RS232 and RS485	RS485
Soft name channel	Channel 0	Channel 1
Label of the associated led	Com1	Com2

Soft parameters

Speed	300 to 115200 bits/s
Data	7 or 8 Bits
Parity	even, odd, no parity
Flux control	No

Wiring

A bridge between terminal 1 and terminal 6 makes it possible to fit a 470 Ω polarisation resistor on the - line.
A bridge between terminal 4 and terminal 9 makes it possible to fit a 470 Ω polarisation resistor on the + line.



Inputs / Outputs

Visualisation by 32 green led : led meanings depends on the type of AES connected underneath and of the embedded soft. See Soft User's Manual of your application.

Generally (under reserves) :

Digital Input	Led lit if input at 1
Digital Output	Led lit if output at 1
Analog Input and Output	Led lit if the value exceeds a maximal value defined by soft by the operator
Safety Input	Led lit or flickering if one of those 4 cases : short-circuit, sensor normally closed, sensor normally open, circuit open

B101, B106, B107 I/O modules

Range

The range is composed of 3 models P ALT AES B10x depending on digital input number :

P ALT AES B10x	24V DC
24 logic inputs, 8 logic outputs	B101
16 logic inputs, 8 logic outputs	B106
8 logic inputs, 8 logic outputs	B107

The package you received contains:

- One of the above-mentioned modules.
- A removable, modifiable label to insert under the screen-printing of the Central Processing Unit and Networks module (UCR).
- The present manual ref. ALT DOC 0 02 E

In addition, you will need from 2 to 4 (depending on your module) input/output connectors with a 3.81 pitch, sold separately, ref. P ALT ACC B004.

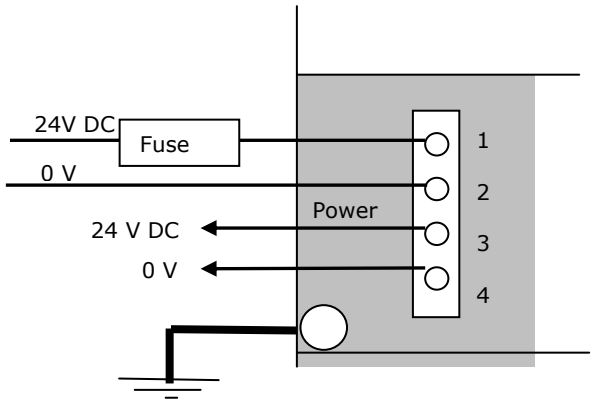
Warning
Install the AES module on the UCR module before switching on the power.
Do not touch an AES module that doesn't have the UCR module when the power is switched on.

Failure to observe these precautions may lead to personal injury or cause the device to be damaged.

Power Supply

Wiring

24V DC (B10x)
Power supply is
available on wiring connections 3 and 4 .



Specifications

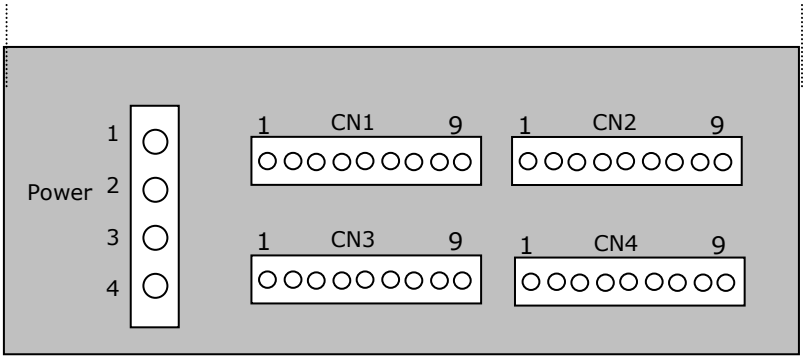
Range Voltage	Vdc	19.2 to 36
Connector		4 screw wiring connections with a 5.08mm pitch
External protection		Temporised fuse 4A
AES absorbed power	W	3.6, excluding input output consumption ; add UCR consumption
Isolation voltage	Vrms	1780 between the input and the chassis ground (50 Hz sine-wave signal)
Power reserve	ms	10, excluding output consumption

Consumption

Alto complete consumption (AES + UCR + output power supply) is limited to 4 A.
AES consumption is 150 mA max. Verify the UCR consumption on its own documentation.
Deduce the max consumption the product can accept on its outputs.
Example : AES= 150 mA ; UCR= 160 mA => Reste pour les sorties : 3690 mA max
To choose the right power supply, add input consumption : 4.2 mA per input.

Digital Input/Output

Connectors Position and I/O numeration



Connectors used depending on module :

X : connector present - : connector absent

	CN1	CN2	CN3	CN4
AES B101	X	X	X	X
AES B106	X	X	-	X
AES B107	X	-	-	X

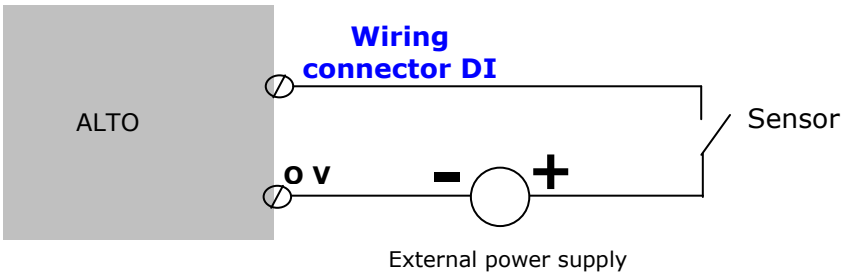
Channel position

DI = Digital Input DO =Digital Output

Wiring connector	1	2	3	4	5	6	7	8	9
CN1	0V	DI 1	DI 2	DI 3	DI 4	DI 5	DI 6	DI 7	DI 8
CN2	0V	DI 9	DI 10	DI 11	DI 12	DI 13	DI 14	DI 15	DI 16
CN3	0V	DI 17	DI 18	DI 19	DI 20	DI 21	DI 22	DI 23	DI 24
CN4	0V	DO 1	DO 2	DO 3	DO 4	DO 5	DO 6	DO 7	DO 8

Digital input

Wiring per channel



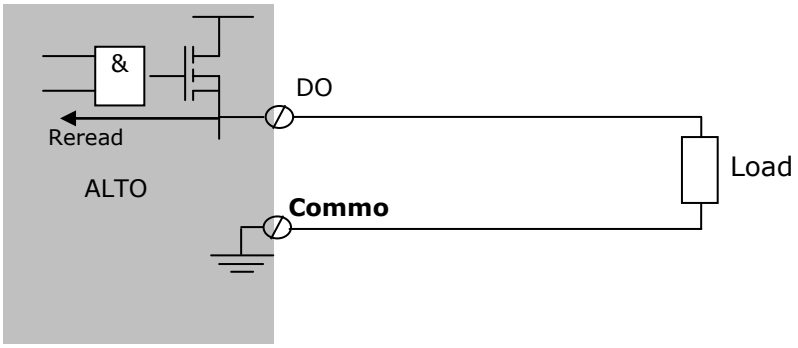
Specifications

Rated voltage	Vdc	24
Type		P , the input switches to +24V ; Standard IEC1131 type 1 resistive
Input impedance	kΩ	5.7
Rated current at rated voltage	mA	4.2
High level	V	Voltage higher than 45% of rated voltage
Low level	V	Voltage lower than 35% of rated voltage

Input sensor common		On the + side of the power supply
Protection		Against over voltages up to 50V, against polarity reversal, against chock waves (2kV)
Safety		Periodic test of the comparison circuit
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)

Digital Output

Wiring



Specifications

Voltage	Vdc	Power supply voltage minus 0.2V
Max. rated current per channel	mA	600 but the sum of the 8 channels must be lower than 3.5A
Load common		At 0V of power supply
Protection		Against over voltage ; Against 2 kV impulse waves
Safety		Re-reading of the output control currents Redundancy of control : output transistor is controlled by the combination of 2 internal bits.
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)

B102 Universal analog module

Range

P ALT AES B 102 : 8 universal analog input, 2 analog output , 4 digital input, 4 digital output

The package you received contains:

- the above-mentioned module.
- A removable, modifiable label to insert under the screen-printing of the Central Processing Unit and Networks module (UCR).
- The present manual ref. ALT DOC 0 05 E

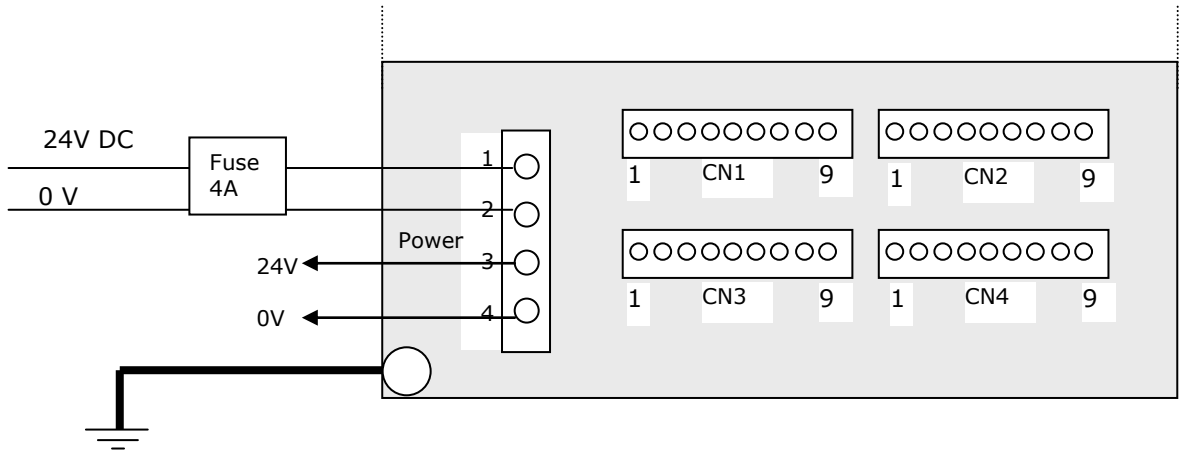
In addition, you will need 4 input/output connectors with a 3.81 pitch, sold separately, ref. P ALT ACC B004.

Warning

- **Install the AES module on the UCR module before switching on the power.**
- **Do not touch an AES module that doesn't have the UCR module when the power is switched on.**

Failure to observe these precautions may lead to personal injury or cause the device to be damaged.

Power supply wiring and connector position



Inputs / Outputs

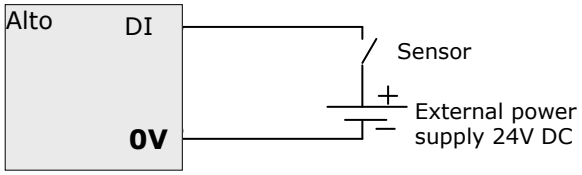
Position

DI = Digital Input DO = Digital Output
AI = Analog Input AO = Analog Output

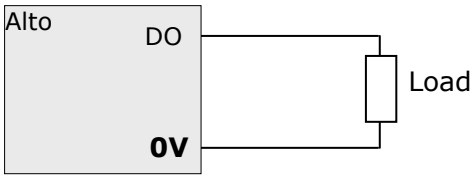
Borne	1	2	3	4	5	6	7	8	9
CN1	0V	DI 1	DI 2	DI 3	DI 4	DO 1	DO 2	DO 3	DO 4
CN2	AI 1+	AI 1-	AI 1 0V	AI 2+	AI 2-	AI 2 0V	AI 3+	AI 3-	AI 3 0V
CN3	*0V*	*AO 1*	*AO2*	AI 4+	AI 4-	AI 4 0V	AI 5+	AI 5-	AI 5 0V
CN4	AI 6+	AI 6-	AI 6 0V	AI 7+	AI 7-	AI 7 0V	AI 8+	AI 8-	AI 8 0V

Wiring

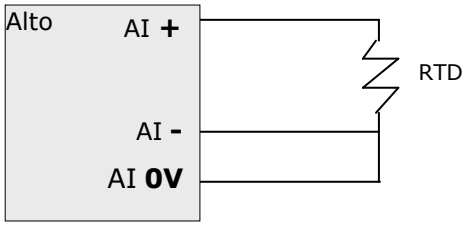
Digital input



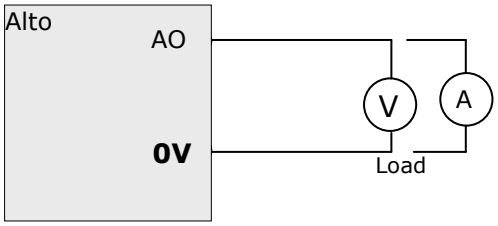
Digital output



RTD analog input

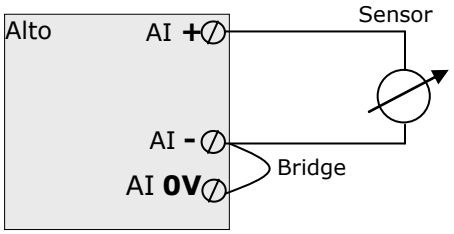


Analog output



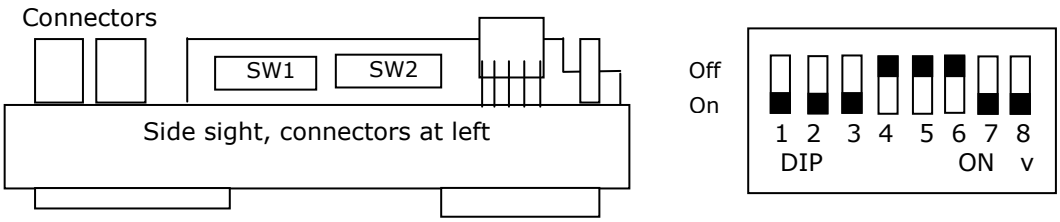
Analog voltage, current or thermocouple input

<u>For thermocouple measurements :</u> the cold-welding compensation is done by the temperature measurement of wiring connection on input AI1. If inputs are used in thermocouple, <u>input AI1 must be set as thermocouple</u>.



Parameter settings

Type of analog input : voltage, thermocouple, RTD or current input, is done via 2 switches.



	SW1							
Switch	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
For input	***AI1***	***AI2***	***AI3***	***AI4***	***AI5***	***AI6***	***AI7***	***AI8***

SW2							
1	***2***	***3***	***4***	***5***	***6***	***7***	***8***
AI1	***AI2***	***AI3***	***AI4***	***AI5***	***AI6***	***AI7***	***AI8***

Type input	***To set input no i***	
	Switch i of SW1	***Switch i of SW2***
Voltage or thermocouple	**OFF**	**OFF**
Current	**OFF**	**ON**
RTD	**ON**	**OFF**
(Not used)	**ON**	**ON**

For voltage type Input : the range choice 10V, 1V or 100mV is done by soft.
For Thermocouple and RTD type input : the sensor choice is done by soft.
For analog output type : the voltage or current range choice is done by soft.
See the User's software documentation for this soft settings.

Specifications

Power supply

Voltage	Vdc	24 +-20%
Absorbed current max	mA	AES : 100 mA + 1mA per Pt100 channel + 20 mA per analog current output. Add the UCR consumption.
Inrush Current	A	20 µs : 7.8 A ; 50 µs : 5 A ; 100 µs : 2 A ; 150 µs : nominal
Isolation voltage	V rms	1000 between power supply and logic (sine-wave 50 Hz)
Isolation voltage	V rms	1780 between the input and the chassis ground (50 Hz sine-wave signal)
Power reserve	ms	10, excluding output consumption

Digital input

Rated voltage	Vdc	24
Type		P , the input switches to +24V ; Norme CEI1131 type 1 resistive
Input impedance	kΩ	5,7
Rated current at rated voltage	mA	5
High level	V	Voltage higher than 45% of V nominal
Low level	V	Voltage lower than 35% of V nominal
Input sensor common		On the + side of the power supply
Protection		Against over voltages up to 50V, against polarity reversal, against chock waves (2kV)
Safety		Periodic test of the comparison circuit
Signaling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)

Digital output

Voltage	Vdc	Power supply voltage – 0.2V
Max. rated current per channel	mA	700 but the sum of the 4 channels must be lower than 2A
Load common		At 0V of power supply
Protection		Against over voltage ; Against 2 kV impulse waves
Safety		Re-reading of the output control currents Redundancy of control : output transistor is controlled by the combination of 2 internal bits.
Signaling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)

Analog input (common specifications)

Rated voltage	Vdc	24
Conversion		Sigma/delta with auto calibration of each measure
Filtration of power supply perturbations	dB	-110 (soft choice : 50hz or 60hz)
Acquisition frequency	ms	1440 if 50Hz filtration, 1200 if 60Hz filtration
Breakage frequency	Hz	36 (attenuation at 1hz = 0.04%)

Voltage Analog Input

3 ranges	V	± 10	± 1	± 0.1
Input impedance	kΩ	127	10000	10000
Resolution	mV	1	0,1	0,01
Drift	Ppm/°C	70	35	90
Precision	%	0.4 at 25°C ambient, 0.8 at 70°C ambient		2%
Signaling		1 green LED on the UCR Lit if input value is overtaking a soft threshold		

Current Analog Input

Ranges	mA	± 20	4-20
Input impedance	Ω	180	
Resolution	µA	1	
Precision	%	0.3 at 25°C ambient, 0.6 at 70°C ambient	
Drift	Ppm/°C	95	
Signaling		1 green LED on the UCR Lit if input value is overtaking a soft threshold	

RTD Analog Input

Ranges Pt100 Pt1000	 Ω Ω	 18.49 (-200°C) to 390.26 (850°C) 199.49 (-200°C) to 2427.78 (400°C)
Injected current	mA	1
Resolution	°C	0.2°C between –200° and +850°C
Precision	°C	1°C at 25°C ambient ; 3°C at 70°C ambient
Drift	Ppm/°C	70
Signaling		1 green LED on the UCR Lit if input value is overtaking a soft threshold

Thermocouple Analog Input

Types		B C E J K M N P R S T
cold-welding compensation		by the temperature measurement of wiring connection on input AI1. If inputs are used in thermocouple, **input AI1 must be set as thermocouple.**
Resolution		1° C
Precision	°C	5°C at 25°C ambient ; 8°C at 70°C ambient
Drift	Ppm/°C	90
Signaling		1 green LED on the UCR Lit if input value is overtaking a soft threshold

Analog output

Types		0-10V	0-20mA (4-20mA by soft)
Resolution		1 mV	1 µA
Factory settings		Current output – output at 0mA	
Precision	%	0.2 at 25°C ambient ; 0.5 at 70°C ambient	
Signaling		1 green LED on the UCR. Depends on UCR soft.	

B103,B104,B303,B304 I/O modules

Range

	24V DC	12 V DC
16 input / 8 relay output	P ALT AES B103	P ALT AES B303
8 input / 8 relay output	P ALT AES B104	P ALT AES B304

The package you received contains:

- One of the above-mentioned modules.
- A removable, modifiable label to insert under the screen-printing of the Central Processing Unit and Networks module (UCR).
- The present manual

In addition, you will need from 3 to 4 (depending on your module) input/output connectors with a 3.81 pitch, sold separately, ref. P ALT ACC B004.

Warning

- **Install the AES module on the UCR module before switching on the power.**
- **Do not touch an AES module that doesn't have the UCR module when the power is switched on.**

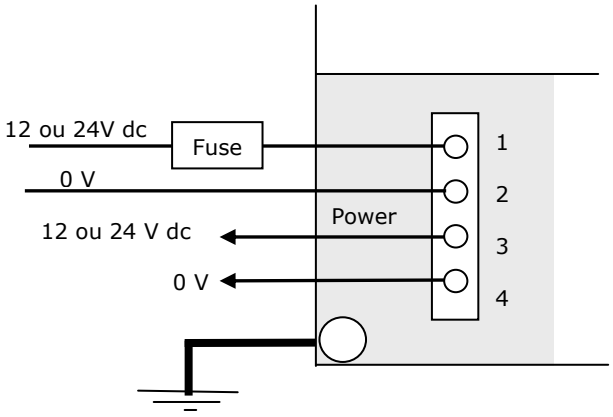
Failure to observe these precautions may lead to personal injury or cause the device to be damaged.

Power Supply

Wiring

24V dc (B1xx) et 12v dc (B3xx)

Power supply is
available on wiring connections 3 and 4 .



Specifications common to both power supplies

Connector		4 screw wiring connections with a 5.08mm pitch
AES absorbed power	W	3.6, excluding input output consumption ; add UCR consumption
Isolation voltage	Vrms	1780 between the input and the chassis ground (50 Hz sine-wave signal)

Power supply 24V dc specifications (model AES B1xx)

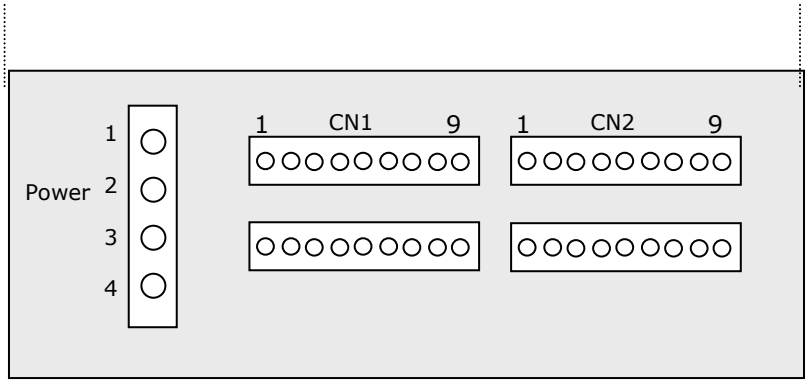
Range Voltage	Vdc	19.2 to 36
External protection		Temporised fuse 1A
Power reserve	ms	10

Power supply 12V dc specifications (models AES B3xx)

Range Voltage	Vdc	10.8 à 18
External protection		Temporised fuse 1.5 A
Power reserve	ms	Case of low voltage decrease: Alto will save its internal data when voltage will be less than 10.8 V, then will stop. Alto in 12v don't have some power reserve : if the power cut is quick, any internal data are saved.

Input / output

Connectors Position and I/O numeration



Channel position

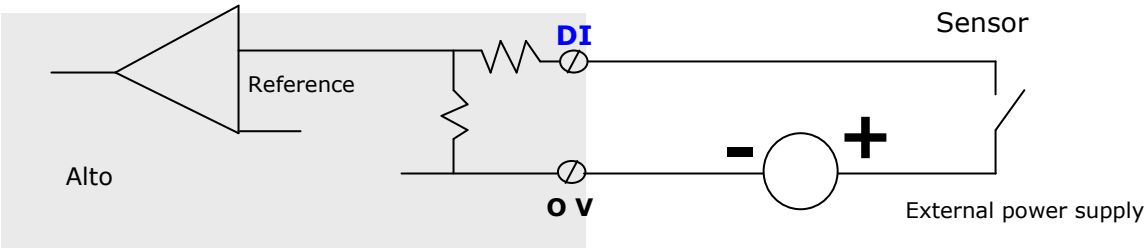
DI = Digital Input
RO i C =Relay Output number i wiring connection Common
RO i W =Relay Output number i wiring connection Working
NC = Not used

CN3 is absent on module AES B x04.

Wiring connector	1	2	3	4	5	6	7	8	9
CN1	0V	DI 1	DI 2	DI 3	DI 4	DI 5	DI 6	DI 7	DI 8
CN2	NC	RO 1 C	RO 1 W	RO 2 C	RO 2 W	RO 3 C	RO 3 W	RO 4 C	RO 4 W
CN3	0V	DI 9	DI 10	DI 11	DI 12	DI 13	DI 14	DI 15	DI 16
CN4	NC	RO 5 C	RO 5 W	RO 6 C	RO 6 W	RO 7 C	RO 7 W	RO 8 C	RO 8 W

Digital input

Wiring per channel

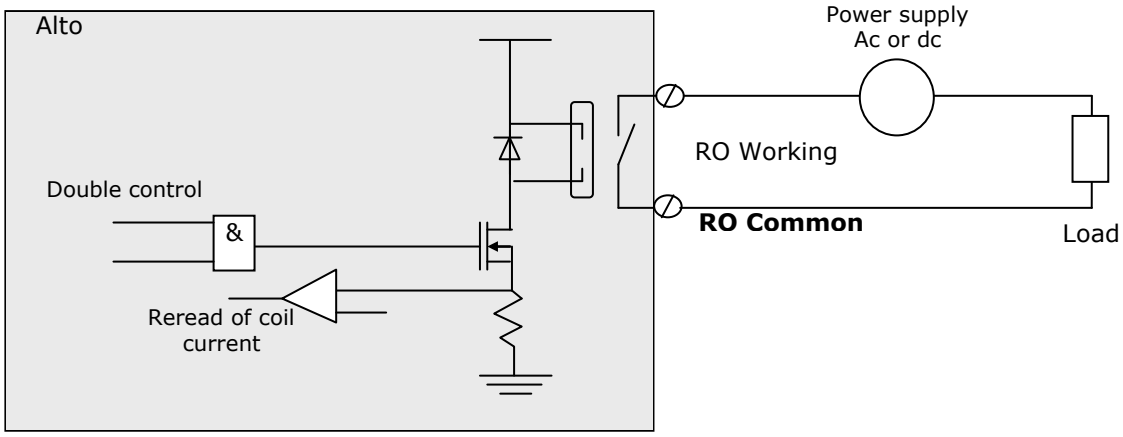


Specifications

		P ALT AES B1xx	P ALT AES B3xx
Rated voltage	Vdc	24	12
Input impedance	kΩ	5,7	7,1
Rated current at rated voltage	mA	4,2	1,7
Type		P , the input switches to the + of the power supply ; Standard IEC1131 type 1 resistive	
High level	V	Voltage higher than 45% of rated voltage	
Low level	V	Voltage lower than 35% of rated voltage	
Protection		Against over voltages up to 50V, against polarity reversal, against chock waves (2kV)	
Safety		Periodic test of the comparison circuit	
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)	

Digital Relay Output

Wiring per channel



Specifications

Type of relay		1 working contact
Rated current	A	6
Max voltage switching	V	AC : 400 DC : 300
max breakage capacity		AC : 1500 VA DC on resistive load : 300Vdc at 150mA ; 30Vdc at 4A
Dielectric rigidity	V rms	coil - contacts : 4000 between open contacts: 1000
Shock waves immunity coil - contacts	V	6000 (wave 1.2 / 50 µs)
Expected life		> 5.000.000 mechanical switches
Safety		Control Redundancy Re-reading of the output control currents
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)

B108,B109,B110,B111 : Analog modules

Range

The range is composed of 4 models P ALT AES B1xx depending on analog input / output number :
Legend : AI : Analog input ; AO : Analog output

Every module has 4 digital input and 4 digital output.

P ALT AES Bxxx	10 AI / 2AO	8 AI	4 AI	4 AI / 2 AO
24V DC	B108	B109	B110	B111

The package you received contains:

- One of the above-mentioned modules.
- A removable, modifiable label to insert under the screen-printing of the Central Processing Unit and Networks module (UCR).
- The present manual ref. ALT DOC 0 06 E

In addition, you will need from 2 to 4 (depending on your module) input/output connectors with a 3.81 pitch, sold separately, ref. P ALT ACC B004.

Warning

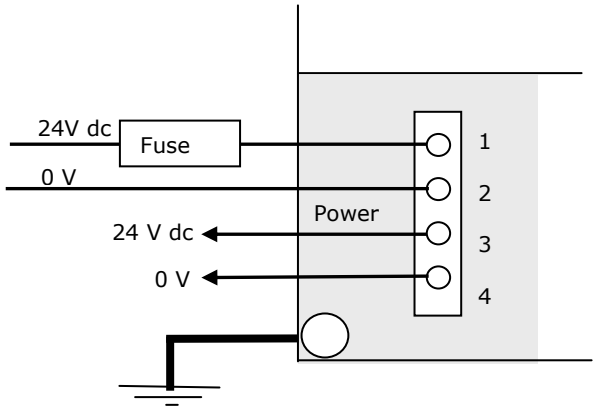
- **Install the AES module on the UCR module before switching on the power.**
- **Do not touch an AES module that doesn't have the UCR module when the power is switched on.**

Failure to observe these precautions may lead to personal injury or cause the device to be damaged.

Power supply

Wiring

Power supply is available on wiring connections 3 and 4 .

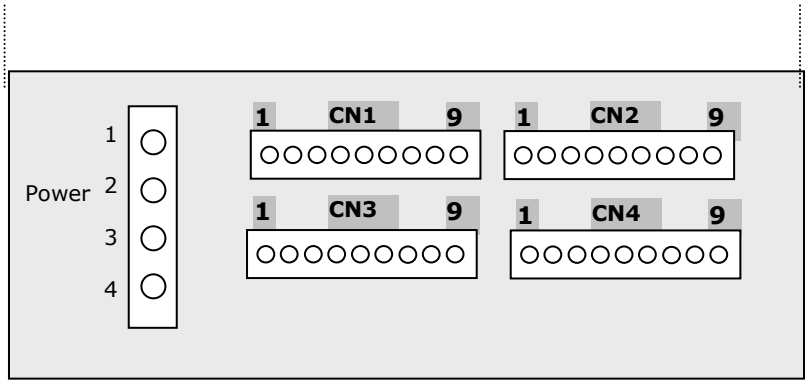


Specifications

Range Voltage	Vdc	19.2 to 36
Connector		4 screw wiring connections with a 5.08mm pitch
External protection		Temporised fuse 1A
AES absorbed power	W	3.6, excluding input output consumption ; add UCR consumption
Isolation voltage	Vrms	1780 between the input and the chassis ground (50 Hz sine-wave signal)
Power reserve	ms	10, excluding output consumption

Input / Output

Connectors position and I/O numeration



X : connector present - : connector absent

	CN1	CN2	CN3	CN4
AES B108	X	X	X	X
AES B109	X	X	X	-
AES B110	X	X	-	-
AES B111	X	X	-	X (*)

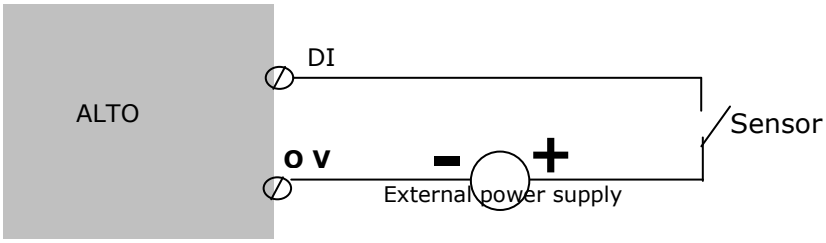
(*)NOTA : analog input no 9 and 10 are absent for AES B111

DI = Digital Input ; DO = Digital Output ; AI = Analog Input ; AO = Analog Output
Com = Input / Output Common

Wiring connector	1	2	3	4	5	6	7	8	9
CN1	Com	DI 1	DI 2	DI 3	DI 4	DO 1	DO 2	DO 3	DO 4
CN2	NC	AI 1 +	AI 1 -	AI 2 +	AI 2 -	AI 3 +	AI 3 -	AI 4 +	AI 4 -
CN3	NC	AI 5 +	AI 5 -	AI 6 +	AI 6 -	AI 7 +	AI 7 -	AI 8 +	AI 8 -
CN4	NC	AI 9 +	AI 9 -	AI 10 +	AI 10 -	*AO 1 +*	*AO 1-*	*AO 2 +*	*AO 2-*

Digital input

Wiring per channel

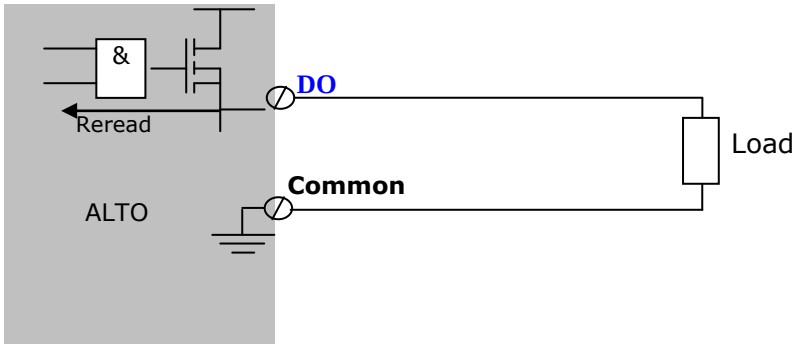


Specifications

Rated voltage	Vdc	24
Type		P , the input switches to +24V ; Standard IEC1131 type 1 resistive
Input impedance	kΩ	5.7
Rated current at rated voltage	mA	5
High level	V	Voltage higher than 45% of rated voltage
Low level	V	Voltage lower than 35% of rated voltage
Input sensor common		On the + side of the power supply
Protection		Against over voltages up to 50V, against polarity reversal, against chock waves (2kV)
Safety		Periodic test of the comparison circuit
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)

Digital Output

Wiring per channel



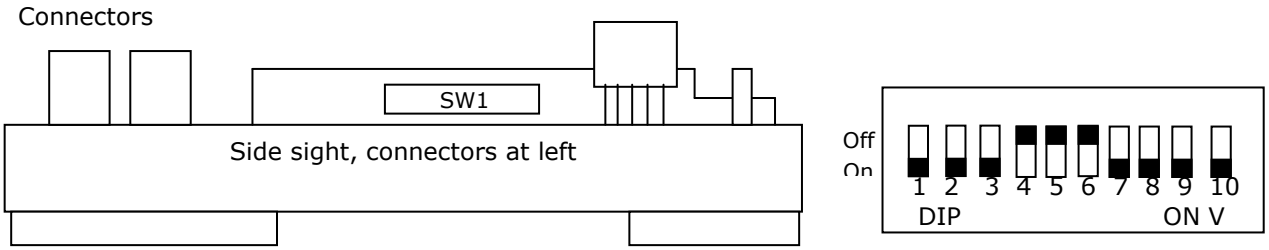
Specifications

Voltage	Vdc	Power supply voltage – 0.2V
Max. rated current per channel	mA	600
Load common		At 0V of power supply
Protection		Against over voltage ; Against 2 kV impulse waves
Safety		Re-reading of the output control currents Redundancy of control : output transistor is controlled by the combination of 2 internal bits.
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)

Analog Input

Parameter settings

The choice for each analog input channel between an voltage or an current input is done by switch : ON = Current ; OFF = Voltage

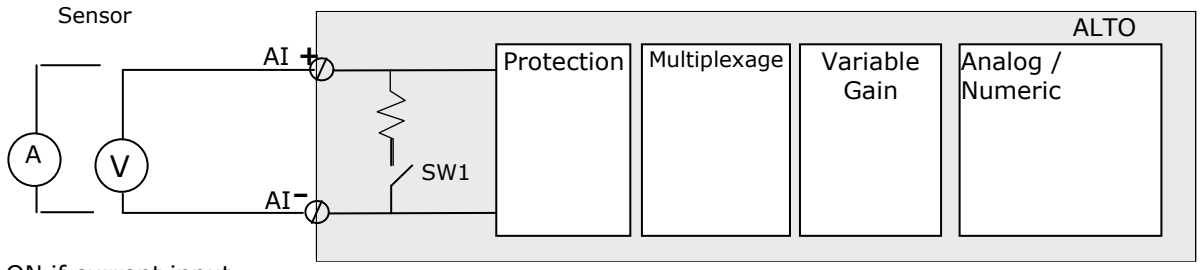


	SW1									
Switch	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
Analog Input	***AI1***	***AI2***	***AI3***	***AI4***	***AI5***	***AI6***	***AI7***	***AI8***	***AI9***	***AI10***

Example : input 1,2,3,7,8,9 and 10 are set as current input, input 4,5 and 6 are set as voltage input.

For voltage input : range choice 10V, 1V or100mV is done by soft.
For current input : range choice ±20mA or 4-20mA is done by soft.
For analog output : the choice between Voltage or Current is done by soft.
See the User's software documentation for this soft settings.

Wiring



SW1 ON if current input

Specifications

Common Specifications to both analog input

Acquisition frequency	ms	10
Breakage frequency	Hz	83

Voltage analog input

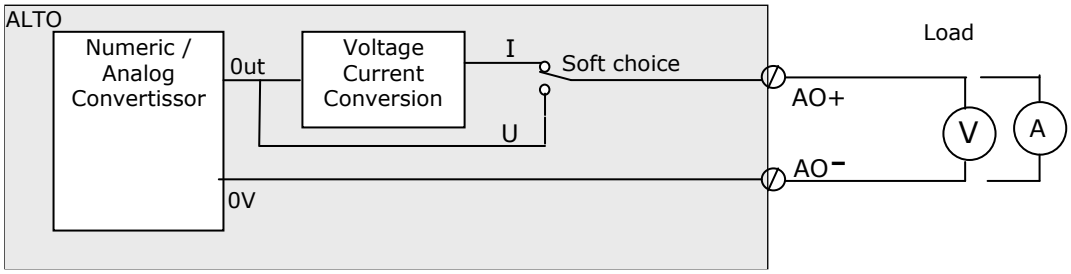
3 ranges	V	± 10	±1	±0,1
Resolution	mV	1	0.1	0,01
Input impedance	GΩ	>1		
Isolation		Don't exceed 50V between AI+ or AI- and the 0V of power supply.		
Precision	%	0.15 at 25°C ambient, 0.3 at 70°C ambient		
Signaling		1 green LED on the UCR Lit if input value is overtaking a soft threshold		

Current analog input

Range	mA	± 20	4-20
Resolution	µA	1	
Input impedance	Ω	180	
Precision	%	0.25 at 25°C ambient, 0.5 at 70°C ambient	
Signaling		1 green LED on the UCR Lit if input value is overtaking a soft threshold	

Analog output

Wiring



Specifications

Types		±10V	0-20mA (4-20mA by soft)
Resolution		1 mV	1 µA
Load impedance	Ω	> 1000	< 520
Factory settings		Current output – output at 0mA	
Precision	%	0.2 at 25°C ambient ; 0.5 at 70°C ambient	
Signaling		1 green LED on the UCR : Lit blinking if input value is : - Voltage range : current is over 11.9mA - Current range 4-20mA : current is less than 3mA	

B112, B312 : modules with 32 digital inputs (12V, 24V)

Range

P ALT AES Bx12	24V DC	12V DC
32 inputs	B112	B312

The package you received contains:

- One of the above-mentioned modules.
- A removable, modifiable label to insert under the screen-printing of the Central Processing Unit and Networks module (UCR).
- The present manual

In addition, you will need 4 input connectors with a 3.81 pitch, sold separately, ref. P ALT ACC B004.

Warning

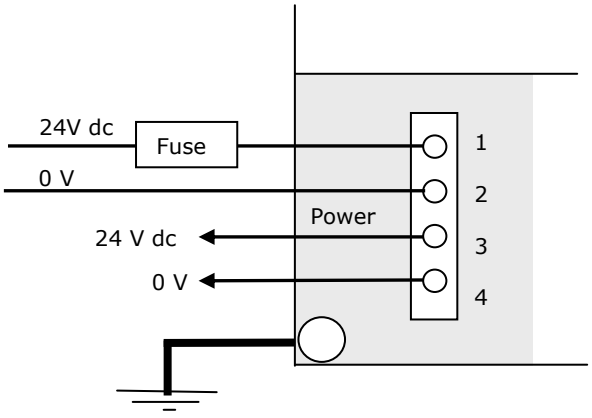
- **Install the AES module on the UCR module before switching on the power.**
- **Do not touch an AES module that doesn't have the UCR module when the power is switched on.**

Failure to observe these precautions may lead to personal injury or cause the device to be damaged.

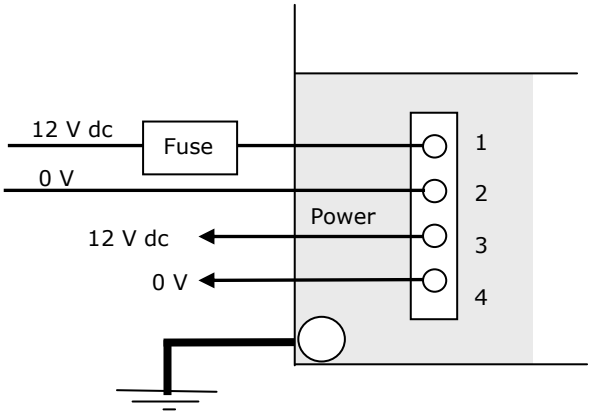
Power Supply

Wiring

24V dc (B1xx)
Power supply is
available on wiring connections 3 and 4 .



12V dc (B3xx)
Power supply is
available on wiring connections 3 and 4 .



Specifications common to both power supplies

Connector		4 screw wiring connections with a 5.08mm pitch
AES absorbed power	W	3.6, excluding input output consumption ; add UCR consumption
Isolation voltage	Vrms	1780 between the input and the chassis ground (50 Hz sine-wave signal)

Power supply 24V dc specifications (model AES B1xx)

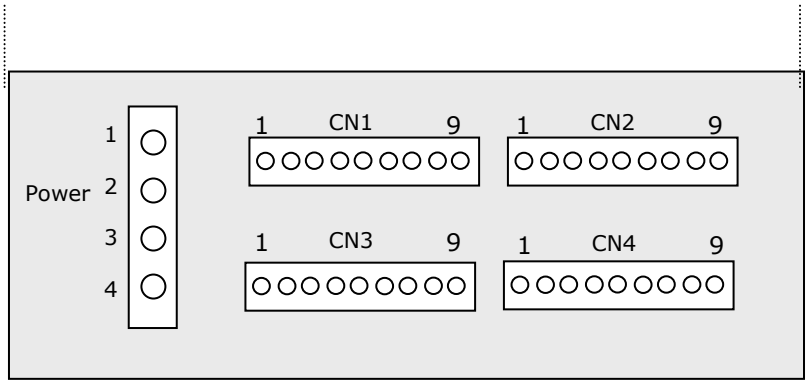
Range Voltage	Vdc	19.2 to 36
External protection		Temporised fuse 1A
Power reserve	ms	10

Power supply 12V dc specifications (models AES B3xx)

Range Voltage	Vdc	10.8 à 18
External protection		Temporised fuse 2 A
Power reserve	ms	Case of low voltage decrease: Alto will save its internal data when voltage will be less than 10.8 V, then will stop. Alto in 12v don't have some power reserve : if the power cut is quick, any internal data are saved.

Digital Input

Connectors Position and I/O numeration

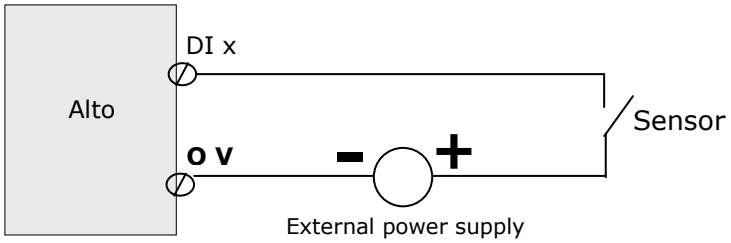


Channel position

DI = Digital Input

Wiring connector	1	2	3	4	5	6	7	8	9
CN1	0V	DI 1	DI 2	DI 3	DI 4	DI 5	DI 6	DI 7	DI 8
CN2	0V	DI 9	DI 10	DI 11	DI 12	DI 13	DI 14	DI 15	DI 16
CN3	0V	DI 17	DI 18	DI 19	DI 20	DI 21	DI 22	DI 23	DI 24
CN4	0V	DI 25	DI 26	DI 27	DI 28	DI 29	DI 30	DI 31	DI 32

Wiring per channel



Specifications

Rated voltage	Vdc	AES B112 : 24	AES B312 : 12
Input impedance	kΩ	5,7	7,1
Rated current at rated voltage	mA	4,2	1,7
Type		P , the input switches to the + of the power supply ; Standard IEC1131 type 1 resistive	
High level	V	Voltage higher than 45% of rated voltage	
Low level	V	Voltage lower than 35% of rated voltage	
Protection		Against over voltages up to 50V, against polarity reversal, against chock waves (2kV)	
Safety		Periodic test of the comparison circuit	
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)	

B212 : module with 32 digital inputs (220 Vac)

The package you received contains:

- One of the above-mentioned modules.
- A removable, modifiable label to insert under the screen-printing of the Central Processing Unit and Networks module (UCR).
- The present manual

In addition, you will need 4 input connectors with a 3.81 pitch, sold separately, ref. P ALT ACC B004.

Warning

- **Install the AES module on the UCR module before switching on the power.**
- **Do not touch an AES module that doesn't have the UCR module when the power is switched on.**

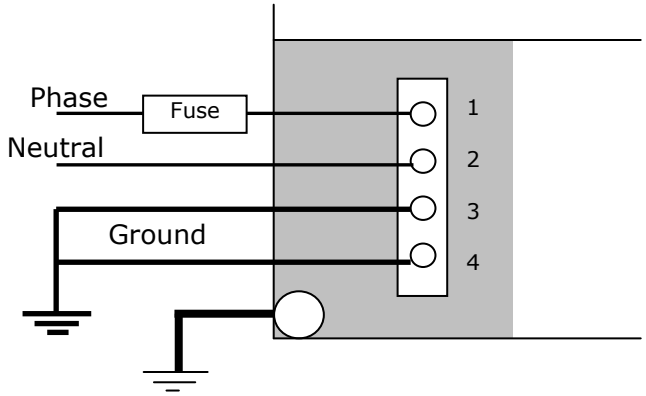
Failure to observe these precautions may lead to personal injury or cause the device to be damaged.

Power Supply

Wiring

115-230V AC (B2xx)

Ground : wiring connections 3 and 4

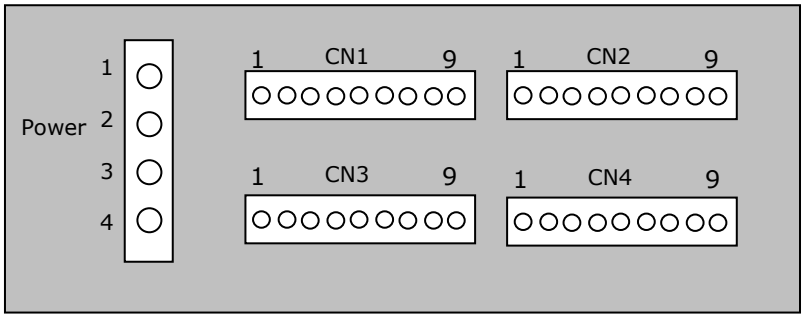


Specifications

Voltage	Vrms	100 to 265
Frequency	Hz	50 to 60
Connector		4 screw wiring connections with a 5.08mm pitch
External protection		Temporised Fuse 0.5 A
Absorbed power	W	5 (Add UCR unit consumption)
galvanic isolation between primary and secondary	V AC	3000 during 1mn
Power reserve	ms	10

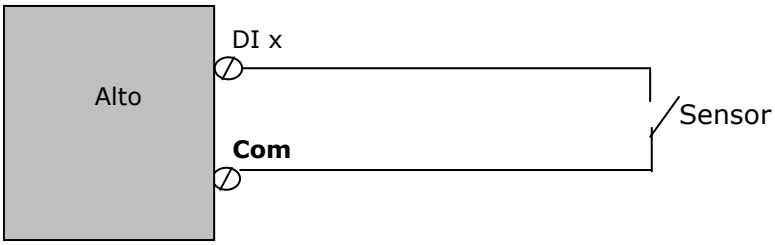
Digital Input

Connectors Position and I/O numeration



Wiring connector	1	2	3	4	5	6	7	8	9
CN1	Com	DI 1	DI 2	DI 3	DI 4	DI 5	DI 6	DI 7	DI 8
CN2	Com	DI 9	DI 10	DI 11	DI 12	DI 13	DI 14	DI 15	DI 16
CN3	Com	DI 17	DI 18	DI 19	DI 20	DI 21	DI 22	DI 23	DI 24
CN4	Com	DI 25	DI 26	DI 27	DI 28	DI 29	DI 30	DI 31	DI 32

Wiring per channel



Specifications

Rated voltage	Vdc	Voltage furnished by the module
Type		P , the input switches to the +24V ; Standard IEC1131 type 1 resistive
Input impedance	kΩ	5.7
Protection		Against over voltages up to 50V, against polarity reversal, against chock waves (2kV)
Safety		Periodic test of the comparison circuit
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)

B113, B213, B313 : modules with secure inputs

Range

The range is composed of 3 models P ALT AES Bx13 depending on the power supply type.

P ALT AES Bx13	24 Safety digital inputs / 4 Relay digital outputs
24V DC	B113
110-220V AC	B213
12V DC	B313

The package you received contains:

- One of the above-mentioned modules.
- A removable, modifiable label to insert under the screen-printing of the Central Processing Unit and Networks module (UCR).

In addition, you will need 4 input/output connectors with a 3.81 pitch, sold separately, ref. P ALT ACC B004.

Warning

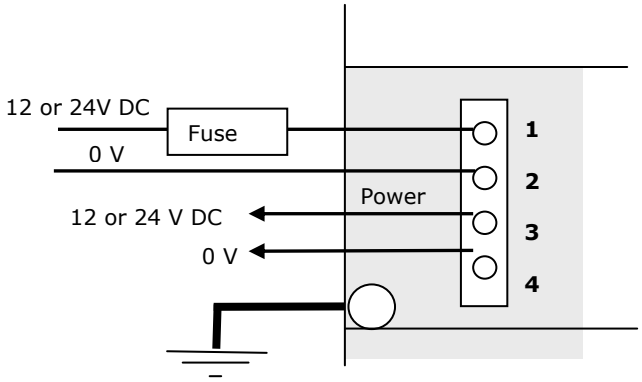
- **Install the AES module on the UCR module before switching on the power.**
- **Do not touch an AES module that does not have the UCR module when the power is switched on.**

Failure to observe these precautions may lead to personal injury or cause the device to be damaged.

Power Supply

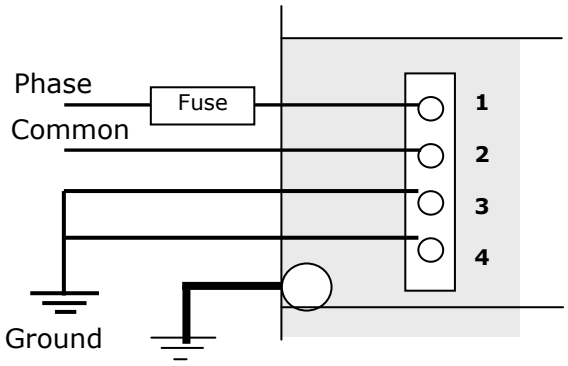
24V DC (B1xx) and 12V DC (B3xx)

Voltage power supply is
Available on wiring connections 3 and 4 .



110-220V AC (B2xx)

Ground : wiring connections 3 and 4



Common Specifications to the 3 power supplies

Connector		4 screw wiring connections with a 5.08mm pitch
Absorbed current	W	3.6 (Add UCR unit consumption)
Isolation voltage	Vrms	1780 between the input and the chassis ground (50 Hz sine-wave signal)

Specifications 24V power supply (AES B113)

Voltage	Vdc	19,2 to 36
External protection		Temporised Fuse 1A
Power reserve	ms	10, excluding output consumption

Specifications 12V power supply (AES B313)

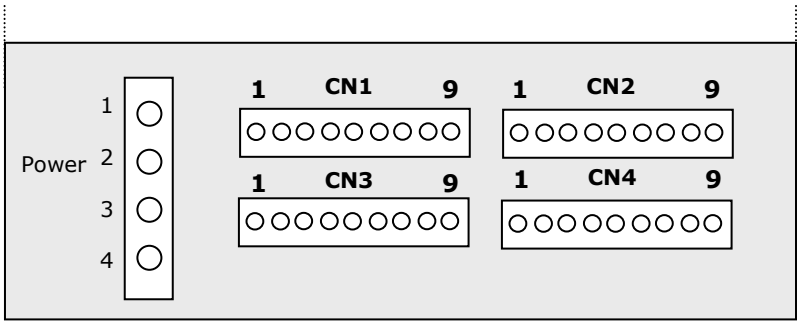
Voltage	Vdc	10.8 to 18
External protection		Temporised Fuse 2A
Power reserve		**No**

Specifications 110-220V power supply (AES B 213)

Voltage	Vrms	85 to 265
External protection		Temporised Fuse 0.5 A
galvanic isolation between primary and secondary	V AC	3000 during 1mn
Power reserve	ms	10

Wiring of Inputs and Outputs

Position of connectors



Channel position on modules

Com E = Input Common, NC =Not Connected ,
SdI = Safety digital Input RdO =Relay digital output

Borne	1	2	3	4	5	6	7	8	9
CN1	Com E	SdI 1	SdI 2	SdI 3	SdI 4	SdI 5	SdI 6	SdI 7	SdI 8
CN2	***NC***	***RdO 1a***	***RdO 1b***	***RdO 2a***	***RdO 2b***	***RdO 3a***	***RdO 3b***	***RdO 4a***	***RdO 4b***
CN3	Com E	SdI 9	SdI 10	SdI 11	SdI 12	SdI 13	SdI 14	SdI 15	SdI 16
CN4	Com E	SdI 17	SdI 18	SdI 19	SdI 20	SdI 21	SdI 22	SdI 23	SdI 24

Safety digital input (wiring control)

Function

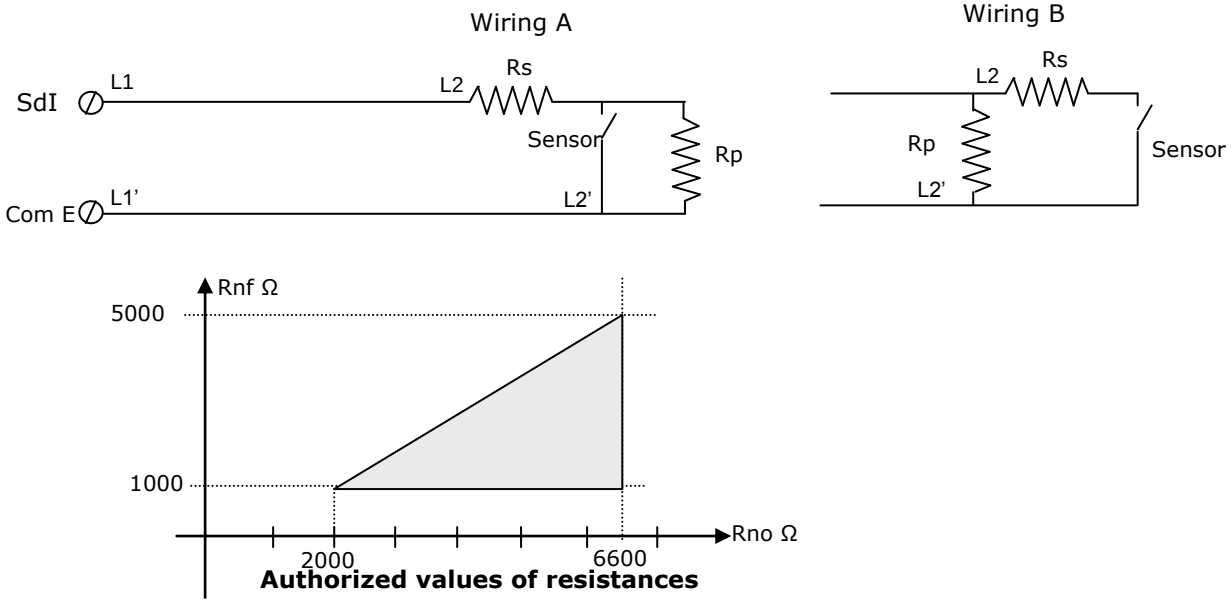
2 resistors (serial resistor : Rs, and parallel resistor: Rp) wired close to sensor allow the « safety digital input » to discriminate difference between the sensor normal opening, the sensor normal closing, a short circuit or a circuit link breakage between points L1 and L2 , L1' and L2' (see following schema). That discrimination is allowed by the successive inspection of 3 threshold between the 4 following states : Short Circuit (SC), Normally Close (NC), Normally Open (NO), Circuit Open (CO).

The line resistance L1;L2 + L'1;L'2 can be at maximum 600Ω !

Wiring

2 wiring resistor types are allowed : wiring A or B underneath.
Soft settings : you have to indicate the equivalent resistance of the resistor network when the sensor is Normally Open (RNO) and when the sensor is Normally Close (RNF).
Warning : RNO and RNF values must be the same for all Input channels.

	Wiring A	Wiring B	Min value	Max value
RNO =	Rs + Rp	Rp	2000 Ω	6600 Ω
RNF =	Rs	(Rs x Rp) / (Rs + Rp)	1000 Ω	6/7 x Rno – 700 Ω

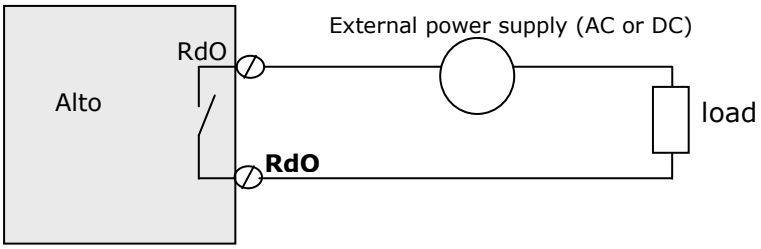


Specifications

Voltage	Vdc	12 (furnished by Alto)
Current in sensor	mA	Between 1.4 and 3.7
Protection		Against Over voltage : 50V max Against polarity inversions Against wave choc : 2kV max
Surety		periodic test of comparison circuit
Channel display		1 green led on UCR - ON : Contact normally closed - OFF : contact normally opened - blinking with 250ms period : Default : short circuit or circuit open
Soft display		1 state digit and 1 default digit per input default state 0 0 normally open 0 1 normally closed 1 0 Circuit open 1 1 Short circuit

Digital output

Wiring connection



Specifications

Relay type		contact 1 T, potential free
Max current per channel	A	6
commutation voltage max	V	AC : 400 DC : 300
Breakage max capacity		AC : 1500 VA DC on resistive load : 300Vdc at 150mA ; 30Vdc at 4A
Dielectric Rigidity	V rms	coils - contacts : 4000 between opened contacts : 1000
Chocks waves between coil and contacts	V	6000 (wave 1.2 / 50 µs)
Expected life		> 5.000.000 mechanical switches
Surety		Reread System of command coils currents
Channel display		1 green led on UCR - ON : relay contact closed - OFF : relay contact opened

B203, B204 : modules with digital inputs and relay outputs

Range

	P ALT AES B203	P ALT AES B204
Digital inputs	16	8
Relay outputs (2 screw)	6	6
Relay outputs (3 screws)	2	2

In addition, you will need 4 input/output connectors with a 3.81 pitch, sold separately, ref. P ALT ACC B004.

Warning

- **Install the AES module on the UCR module before switching on the power.**
- **Do not touch an AES module that does not have the UCR module when the power is switched on.**

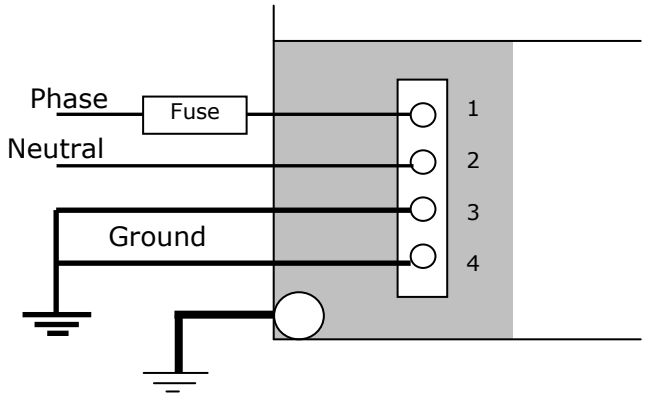
Failure to observe these precautions may lead to personal injury or cause the device to be damaged.

Power Supply

Wiring

115-230V AC (B2xx)

Ground : wiring connections 3 and 4

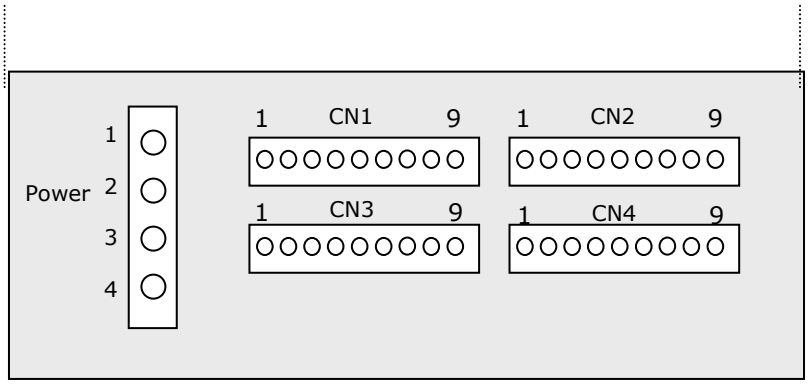


Specifications

Voltage	Vrms	85 to 265
Frequency	Hz	47 to 63
Connector		4 screw wiring connections with a 5.08mm pitch
External protection		Temporised Fuse 0.5 A
Absorbed power	W	5 (Add UCR unit consumption)
galvanic isolation between primary and secondary	V AC	3000 during 1mn
Power reserve	ms	10

Wiring of Inputs and Outputs

Position of connectors



Channel position on modules

DI = Digital Input

RO i R = Inactive Output (see diagram below)
RO i C = Common Output
RO i T = Active Output (see diagram below)

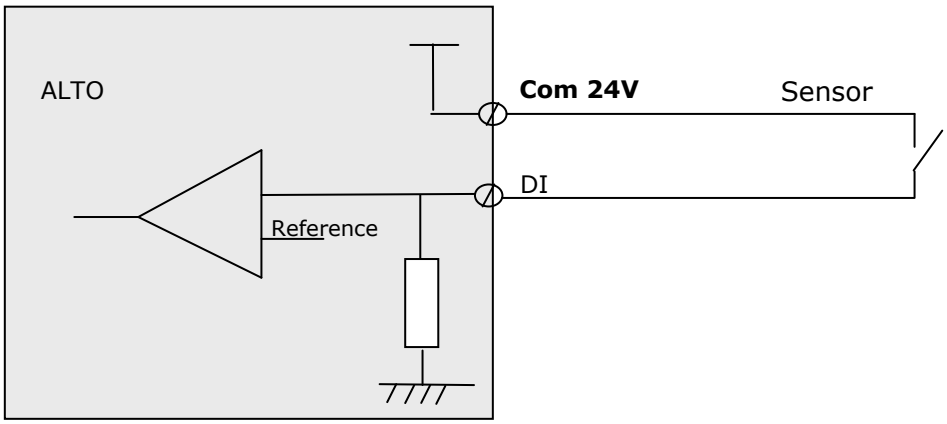
Borne	1	2	3	4	5	6	7	8	9
CN1	Com(24V)	DI 1	DI 2	DI 3	DI 4	DI 5	DI 6	DI 7	DI 8
CN2	RO 1 R	RO 1 C	RO 1 T	RO 2 C	RO 2 T	RO 3 C	RO 3 T	RO 4 C	RO 4 T
CN3	Com(24V)	DI 9	DI 10	DI 11	DI 12	DI 13	DI 14	DI 15	DI 16
CN4	RO 5 R	RO 5 C	RO 5 T	RO 6 C	RO 6 T	RO 7 C	RO 7 T	RO 8 C	RO 8 T

CN3 connector is absent on AES B x04 module

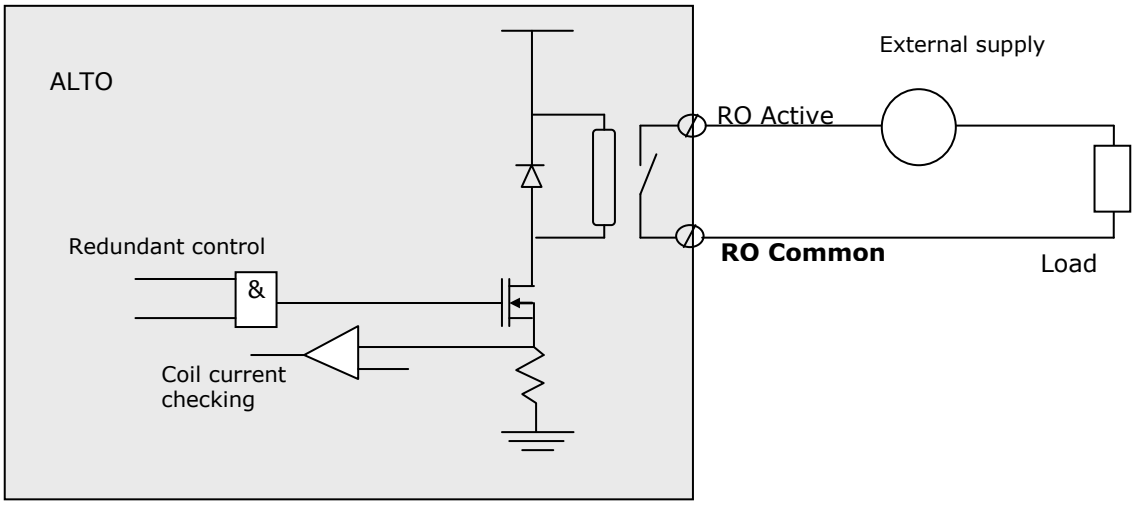
Relays 1 and 5 have 3 outputs : Common / Inactive (R) / Active (T).
Relays 2,3,4,6,7,8 have 2 outputs : Common / Active (T).

Wiring

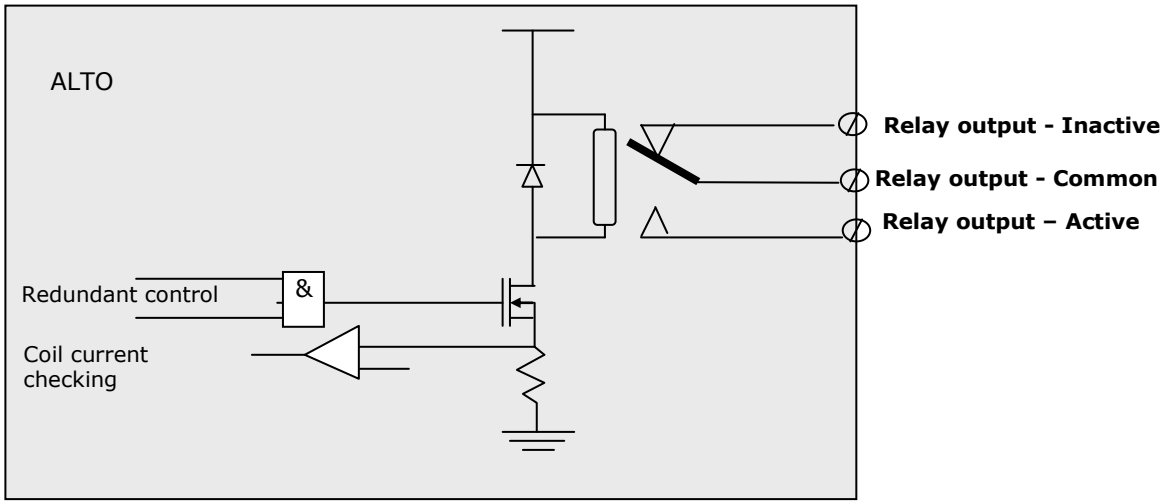
Digital input



Active relay output



Inactive/Active relay output



Specifications

Digital input

Nominal voltage Un	Vdc	24	
Input impedance	kΩ	5,7	
Rated current at rated voltage	mA	4,2	
Type		P , the input switches to the + of the power supply ; Standard IEC1131 type 1 resistive	
High level	V	V > 0.45 Un	
Low level	V	V < 0.35 Un	
Protection		Against over voltages up to 50V, against polarity reversal, against chock waves (2kV)	
Safety		Periodic test of the comparison circuit	
Signalling		1 green LED on the UCR Lit in the closed state (1) ; Unlit in the open state (0)	

Relay output

Relay type		6 relays C/Active and 2 relays C/Inactive/Active
Max current per channel	A	6
commutation voltage max	V	AC : 400 DC : 300
Breakage max capacity		AC : 1500 VA DC on resistive load : 300Vdc at 150mA ; 30Vdc at 4A
Dielectric Rigidity	V rms	coils - contacts : 4000 between opened contacts : 1000
Chocks waves between coil and contacts	V	6000 (wave 1.2 / 50 µs)
Expected life		> 5.000.000 mechanical switches
Surety		Redundant control Reread System of command coils currents
Channel display		1 green led on UCR - ON : relay contact closed - OFF : relay contact opened